Research Report

Physical therapy examination of patients with stroke in clinical affiliations of a university

Peralta CR; Alfonso AD; Cruz AL; Fernandez MM; Buhay ME; Policarpio A; Quezon IJ; Dalusong MT; Uy PJ; Damian RE; and Yu R

ABSTRACT

Objectives: This study aimed to determine most commonly-used physical therapy examination procedures on patients with stroke, determine common patterns in documenting results of examination on patients' charts, and make recommendations regarding improving and standardizing physical therapy practice in clinical evaluation and note taking. ***Methodology:*** Physical therapists of centers affiliated with a university were recruited for the study. Subjects accomplished a survey on PT examination procedures they used on their patients with stroke. Patients' charts in these same centers were reviewed using a formulated checklist. ***Results:*** Fifty-four physical therapists participated in the study, 100% of whom claimed to perform vital signs, ocular inspection, palpation, ROM measurements, manual muscle testing, gait analysis, postural analysis, neurologic evaluation of cerebral functions, sensory testing, and functional analysis on their patients with stroke. The most frequently documented procedures in the 28 charts reviewed were ocular inspection and functional analysis, each seen in 93% of the charts. ***Conclusion:*** The most commonly used physical therapy examination procedures on patients with stroke were considered to be those performed by 100% of the respondents. These procedures were documented manually on charts using the S.O.A.P format. Physical therapists treating patients with stroke should be encouraged to regularly audit their clinical notes to ensure that they have recorded the most appropriate information on patient condition and outcome that will assist them in making efficient and effective treatment decisions.

Keywords: *examination, audit, stroke*

INTRODUCTION

Physical therapy examination is the first step in the clinical decision-making process[1]. Prior to commencing treatment for a patient referred for physical therapy, it is essential to identify the patient's needs by obtaining a history, performing relevant systems reviews, and selecting and administering specific tests and measures to obtain data that can be used to describe the patient's condition, and to assess the effectiveness of treatment[2]. Patient assessment, which includes interviews, observations, and physical examination of the patient, is essential in deciding appropriate treatment strategies[3]. The history guides the physical therapist (PT) in selecting specific tests and measurements to use in conjunction with the systems review, in order to pin-point the patient's problems that would respond to physical therapy. Tests and measurements that are objective, valid, and reliable are most acceptable in current practice, especially with recent emphasis on evidence-based practice[4].

As important as the choice of examination procedures physical therapists make, is the manner in which the results of the examination are recorded. An accurate, clear, and concise documentation of evaluation data is important in order to ensure that these data could be used by other members of the health care team who would be accessing patients' records. Documentation should allow any PT to "connect the dots" for previous care given to patients referred to them[5]. Furthermore, clinical records have significant implications for tracking the quality of care, resource allocation, research and professional litigation[6]. Thus, it is imperative that clinical notes (charts) are well documented using standard record keeping processes and guidelines for recording outcome, screening and treatment information.

At present, physical therapy practice in the Philippines is generally underpinned by Republic Act 5680[7], the Code of Ethics for Physical Therapists[8] and the Standards of Practice of Physical Therapy[9]. Though these documents govern the practice of the profession locally, formalized clinical guidelines for the examination, evaluation, treatment, and documentation of care

for specific conditions referred for physical therapy, tailored to local situation and patients' and therapists' needs have yet to be established. There are few published studies on local practice patterns that contrast recent advances in skills and theory with those being used by Filipino physical therapists. With increasing focus on cost-effective health care delivery system, it is appropriate that Filipino physical therapists take on an active stand in the implementation of current global trends in clinical judgment, decision-making and documentation in measuring the effectiveness of interventions, with the hope of improving professional accountability and enhancing cost effectiveness of the services we provide.

This study was conducted as a precursor to larger quality improvement studies on the management of stroke, one of the most common conditions encountered in physical therapy clinics. The objectives of this study were: (1) to determine the most commonly used physical therapy examination procedures, tests and measurements performed clinically on patients with stroke, (2) to determine common patterns in documenting results of examination on patients' charts, and 3) to make recommendations regarding improving and standardizing physical therapy practice in clinical evaluation and note taking.

METHODOLOGY

This study was conducted in two phases: survey and chart review.

Survey Phase

Selection of Respondents

Training centers and hospitals affiliated with a university and which were catering to patients with stroke were identified for this study. Staff physical therapists of these institutions who treated patients with stroke were recruited. Physical therapists who were solely involved with home health care practices were excluded from this study in order to focus on institutional practices in the examination of patients with stroke. To be eligible for this study, physical therapists should have examined at least one stroke patient in the month prior to the study.

Procedures

A checklist of physical therapy examination procedures applicable to patients with stroke was formulated for the first stage of this study. The contents of the checklist were initially determined through recorded structured interviews with eleven conveniently sampled licensed consenting physical therapists involved in stroke care. The questions in the interview focused on the examination procedures (including tools) that they used and details on how they actually performed each procedure. The interviews were transcribed and the results were developed as a checklist. A separate group of five conveniently sampled licensed physical therapists involved in stroke care commented on the checklist's face validity, and on the completeness and clarity of its contents. Modifications were made to the checklist on the basis of these comments, in order to produce it in its final form[1].

The final checklist consisted of statements on the tools, techniques and procedures used in the physical therapy examination of patients with stroke. Due to the large number of entries included in the final checklist, it was divided into two parts: Part I included vital signs, ocular inspection, palpation, anthropometric measurement, range of motion measurement, manual muscle testing, functional muscle testing and gait analysis; and Part II included postural analysis, evaluation of cerebral functions, cranial nerves, reflexes, sensory testing and functional analysis. The checklist used a five-point Likert-type scale (always, often, sometimes, seldom, never) in order to determine approximate frequency of use of tool, technique or procedure. The checklist was administered in two parts on two separate days within the same week. Participants were instructed to complete the checklist on the same day that they received it.

Chart Review Phase

Chart Selection

Permission was obtained from department heads of centers and hospitals affiliated with the University to review charts of patients with stroke examined by staff physical therapists. In order to qualify for review, a patient's chart must (1) be that of a stroke patient with no other accompanying neurological condition, and (2) have at least one physical therapy initial evaluation or re-evaluation completed over the past six months. Charts that met the criteria were assigned codes to ensure confidentiality of patients' data.

Procedures

A second checklist was formulated to aid the audit of stroke patients' charts. The audit checklist contained headings and sub-items similar to those used in the survey questionnaire, seeking information from the notes on physical therapy examination procedures, tools, and manner of documentation employed. The audit checklist allowed for anecdotal recording of comments on documentation of procedures, with guidelines provided to the chart assessors based on accepted principles in SOAP format[10] and documentation[2], since all of the charts reviewed were noted to be written in SOAP format.

[1] Copy of the checklist may be obtained through communications with the authors.

Ten conveniently sampled licensed physical therapists were asked to comment on the audit checklist's face validity, completeness and clarity of content. Their comments were used to modify the chart review checklist. Four physical therapy student research assistants acted as chart assessors and were trained in the use of the checklist. Each of the checklist items were defined for purposes of clarity and consistency in assessment. Chart assessors were instructed to provide comments on (1) the presence or absence of headings and sub-items on the charts, (2) the sequence of documentation of entries, (3) whether abbreviations used comply with those of Kettenbach (2004)[10], and (4) format and style of documentation. To ensure reliability of chart assessments, each of the assessors was asked to assess the same three charts of patients with stroke using the checklist. Kappa coefficients were used to test inter-rater reliability of chart assessments. Items assessed differently by the authors were discussed in order to clarify meanings, and wording was revised as required.

Data Analysis

This was a descriptive study which utilized quantitative and qualitative methods of analyzing data. Quantitative measures were utilized to determine frequency of use of each physical therapy examination procedure, tool, and technique. Qualitative measures were used to analyze anecdotal records of assessments of documentation formats. Comments of assessors on entries in patients' charts and the way they were written were noted and analyzed for common contents and themes[11].

RESULTS

Survey Phase

Of a possible total of 65, 54 staff physical therapists from 11 clinical affiliation centers of a university met the inclusion criteria and agreed to participate in the study. Of the 54 complete sets of questionnaires distributed, 52 Part I questionnaires and 47 Part II questionnaires were returned. Six Part I and 5 Part II questionnaires were discarded due to incomplete data that would add little to the analysis, ending with 46 complete Part I questionnaires and 42 complete Part II questionnaires. The consort diagram outlining the response rates is shown in Figure 1.

Mean age of respondents was 26.2 ± 3.1 years with 49% ranging from 26-30 years of age. Forty-one percent of respondents have been practicing as licensed physical therapists for 3-5 years. Sixty percent reported examining between one and five patients with stroke over the past month while the rest of the respondents reported to have examined more than 5 patients within the same period.

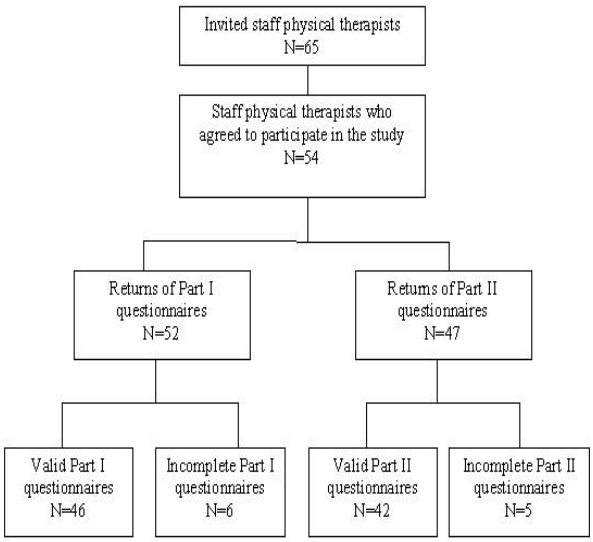

Figure 1. Consort diagram of questionnaire returns

Based on survey results, 100% of respondents performed vital signs, ocular inspection, palpation, range of motion measurements, manual muscle testing, gait analysis, postural analysis, neurologic evaluation of cerebral functions, sensory testing, and functional analysis on their patients with stroke as shown in Table 1.

PT Examination Procedure	No. of Respondents	Percentage
Part I		
Vital signs	46	100
Ocular inspection	46	100
Palpation	46	100
Anthropometric measurements	43	93
Range of motion	46	100
Manual muscle testing	46	100
Functional muscle testing	45	98
Gait analysis	46	100
Part II		
Postural analysis	42	100
Neurologic evaluation of cerebral functions	42	100
Cranial nerve testing	38	91
Pathologic reactions	41	98
Pathologic reflexes	39	93
Deep tendon reflexes	39	93
Sensory testing	42	100
Functional analysis	42	100

Table 1. Survey Respondents Who Perform Each PT Examination Procedure

The Modified Ashworth Scale[12] was used by 67% of the respondents to grade spasticity. Visual estimation and gross assessment of range of motion of joints were performed by 50% respondents while the other half claimed to always

use a standard goniometer for large joints, particularly when there were limitations noted on gross assessment. In using the goniometer, respondents claimed to utilize standard alignment and stabilization[13]. Approximately half the respondents (54%) claimed to always use a 5-point scale in grading muscle strength[14] while Brunnstrom's stages of recovery[15] were used by the remainder of the respondents when assessing muscle strength. A sphygmomanometer's cuff was more often used to measure grip strength than a hand dynamometer. Gait analysis involved observing the quality of both the swing and stance phases, with and without an assistive device and 43% of respondents included gait speed as part of their analysis. The majority of respondents (72%) observed the amount of assistance, compensations, and modifications required to perform daily tasks, such as bed mobility, transfers, and balance as part of their functional analysis. However, only 33% of respondents claimed to use the Functional Independence Measure[9] as an assessment tool with no mention of any other standardized outcome measure to determine function.

Chart Review Phase

Only three of the eleven clinical affiliation centers catering to patients with stroke (27%) granted permission to review patients' charts. A total of 28 charts of patients treated by 14 staff physical therapists with clinical experience ranging from 1-10 years, the majority of which had been practicing for 4-7 years, were reviewed.

There was no PT examination procedure found to be documented on all the charts reviewed, as shown in Table 2.

PT Examination Procedure	No. of Charts	Percentage
Vital signs	25	89
Ocular inspection	26	93
Palpation	25	89
Anthropometric measurements	0	0
Range of motion	25	89
Manual muscle testing	24	86
Functional muscle testing	3	11
Gait analysis	24	86
Postural analysis	11	39
Neurologic evaluation of cerebral functions	1	4
Cranial nerve testing	0	0
Pathologic reactions	0	0
Pathologic reflexes	0	0
Deep tendon reflexes	2	7
Sensory testing	3	11
Functional analysis	26	93

Table 2. Charts Where Each PT Examination Procedure Was Documented

The most frequently documented procedures were ocular inspection and functional analysis, each documented in 93% of the charts. None of the charts documented anthropometric measurements, cranial nerve testing, pathologic reactions, or pathologic reflexes.

All of the charts reviewed were in handwritten SOAP format and none of the three centers used standard documentation forms. There were some commonalities in the manner of documenting chart entries. Range of motion measurements was reported both actively and passively with end-feels noted in 86% of the charts. It was much more common to find documentation of muscle strength using gross assessments of upper extremities and lower extremities (86%) rather than testing individual muscle strength (14%), but the findings in these assessments were likewise documented as MMT. When documenting gait deviations, problems in the swing phase of gait were more commonly documented than those of the stance phase, but it was not clear whether this was due to more problems seen in the former than the latter. Functional analysis was documented based on what the patients were able to do (93%). Use of the Functional Independence Measure as a standardized assessment tool to analyze function was found in 25% of the charts and none of the charts showed use of other standardized assessment tools.

DISCUSSION

Considering that the charts reviewed were provided by only 14 physical therapists from three centers, compared to more than 50 physical therapists from 11 centers who participated in the survey, a direct comparison of the findings in these two phases cannot be made. Yet, several findings require emphasis and have important implications to local physical therapy education and practice.

Physical therapists agree on what should constitute a comprehensive examination of patients with stroke, as demonstrated by the absence of additional examination procedures provided by the respondents aside from those listed in the checklist. It is notable that manual muscle testing (MMT) was considered as an integral part of stroke examination. However, Hislop and Montgomery (2002)[14] stated that MMT is "valid in normal persons and those with…(lower motor neuron lesions and muscle disorders). Its use in persons with disturbances of higher neural centers is flawed because of interference by abnormal sensation, or disturbed tone or motor control." Furthermore, they recommended the use of modified procedures in assessing strength of these types of patients. This may explain why some survey respondents (46%) preferred to use functional methods of assessing

strength such as Brunnstrom's stages of recovery, while 86% of the charts reviewed documented gross examination of muscle strength rather than individual muscle tests. Nevertheless, these were recorded as MMT entries. Students and practitioners should be clarified that, strictly speaking, these measures do not fall under manual muscle testing and may be more appropriately recorded under functional muscle testing.

Certain variations have also been observed in the use of examination tools, such as those utilized for measuring grip strength. It is notable that a sphygmomanometer is a more popular tool and an inexpensive one at that, for measuring grip strength. The reliability of the sphygmomanometer and its modifications in measuring muscle strength has been established for muscles of the neck[16] in normal and symptomatic subjects, and on the elbow extensors[17] of elderly subjects. It is important that further studies be conducted to establish the validity of this tool versus the standard hand dynamometers in measuring grip strength. Furthermore, guidelines on test administration have to be established in order to ensure reliability of measurements.

The limited use of standardized measures of functional outcomes is also another area that needs to be highlighted. The use of standardized outcome measures to determine function requires specialized training and this may be the major factor that limits practitioners from using more valid and reliable measures. Moreover, not all existing standardized outcome measures of function can be readily applied to the local setting since there may be activities unique to the local population. Nevertheless, the physical therapy undergraduate and graduate curricula should provide students with updated information on valid, reliable, and sensitive examination tools available in order to assist them in making decisions on which tools are best to use for their patients.

Choosing appropriate examination tool(s) for a particular client may depend on several factors[18]: (1) client's current functional status (ambulatory vs. non-ambulatory); (2) client's current cognitive status (intact vs. confused / disoriented); (3) the clinical setting in which the person is being evaluated for treatment; (4) client's primary complaints; and (5) client's goals and realistic expectation of recovery. These factors should be considered in conducting succeeding studies of this nature. It is important that physical therapists select tools that measure the client's primary problems in order to direct appropriate treatment planning. It is also important to study the significance of, and differences between, each examination procedure in establishing a total picture of the client's problems and not just in performing them as part of a standard routine. These decisions should be based on clinical reasoning and judgment skills.

Though emphasis should be made on the validity and reliability of the content of the examination, the importance of format and structure in documenting the results cannot be ignored. This study found that not even a single examination procedure has been found to be documented on all 28 charts reviewed. It can be argued that while some procedures may have been inappropriate at the time of the examination, others may have produced normal results upon examination and were therefore not included as entries in the charts, or physical therapists may have deemed some of the procedures unnecessary for the patients they were handling. Whatever the reasons underlying this finding, the non-uniform recording of results of patients' charts accentuates the need for experts to establish guidelines on what and how to document findings. The recommendation of format and structure for documentation will aid physical therapists in carrying out a complete and systematic examination of their patients, with little opportunities of missing out on important procedures that need to be performed. Additionally, the use of standardized forms, checklist formats[19], or even computerized documentation forms[20] may facilitate more uniform recording of results more than the usual handwritten SOAP format. This will ensure appropriate information for communicating results accurately and comparing succeeding results for changes in patients' status. Likewise, the use of standardized forms will help physical therapists in tracking changes in patient status, gathering data for research, and monitoring quality of health care services delivered by the institution.

The findings of this study may have limited external generalizability because of its small sample size. However, it provides a basis from which re-audits can be undertaken. We recommend that further studies be conducted on larger samples of therapists (to validate the assessment items) and larger samples of patient notes written by the same therapists, from hospitals and centers outside Manila or in other regions in the country. Observations of physical therapists as they perform the examination procedures should also be done to validate the results of the survey and chart reviews.

CONCLUSIONS

Despite the limitations of the study, the results have significant implications for practice. Knowing the most commonly-used physical therapy examination procedures will assist training undergraduate and postgraduate therapists in appropriately utilizing the most valid and reliable procedures reported in the

literature. The potential variability in current documentation practices should motivate physical therapists to explore more standardized approaches to recording entries on patient assessment and treatment.

This study indicates that while physical therapists agree on what should constitute a comprehensive examination of stroke patients, variations exist in the way these procedures are carried out and documented. These findings may well be relevant to other physical therapists who treat patients with stroke. Regular audits of assessment and recording practices, and guidelines and standards for clinical notes, will ensure improvements in the quality of physical therapy decision-making regarding treatments provided to patients suffering from stroke.

REFERENCES

[1] Higgs J, Jones M, eds. *Clinical Reasoning in the Health Professions.* Oxford: Butterworth-Heinemann, Ltd.; 1995.

[2] Guide to Physical Therapist Practice. *Phys Ther* 1997;77:1177-1226.

[3] Gustavsen M, Mengshoel AM. Clinical physiotherapy documentation in stroke rehabilitation: an ICIDH-2 Beta-2 based analysis. *Disability and Rehab* 2003;25:1089-1096.

[4] Turner P. Evidence-based practice and physiotherapy in the 1990s. *Physiotherapy Theory and Practice*. 2001;17:107-121.

[5] Lewis K. Do the write thing: document everything!. *PT Magazine* 2002;30-33.

[6] M'Kumbuzi VRP, EalesCJ, Stewart A. An analysis of the completion of physiotherapy clinical records in Gauteng province. *S Afr J Physiother* 2002;58(1):18-27.

[7] Republic of the Philippines Professional Regulations Commission, Board of Physical and Occupational Therapy. *Republic Act No. 5680: An Act Creating the Board of Examiners for Physical Therapists and Occupational Therapists.* Accessed from: http://www.prc.gov.ph/portal_articles.asp?pid=67&sid=307 on May 2, 2007

[8] Republic of the Philippines Professional Regulations Commission, Board of Physical and Occupational Therapy. *Code of Ethics for Physical Therapists.* Accessed from http://www.prc.gov.ph/documents/Board%20of%20Physical-CE.doc on May 2, 2007.

[9] Philippine Physical Therapy Association. *Standards of Practice for Physical Therapy in the Philippines.* Accessed from http://www.angelfire.com/home/ppta/downloadables/standards.htm on May 2, 2007

[10] Kettenbach G: *Writing SOAP notes: with patient/client management formats.* 3rd ed. Philadelphia: F.A. Davis Company, 2004.

[11] Macnee CL. *Understanding nursing research: reading and using research in practice*. Lippincott Williams & Wilkins: Philadelphia, 2004.

[12] O'Sullivan SB, Schmitz TJ. *Physical rehabilitation assessment and treatment*. 3rd ed. Philadelphia: F.A. Davis Company, 1994.

[13] Norkin CC, White DJ. *Measurement of joint motion: a guide to goniometry*. Philadelphia: F.A. Davis, 1995.

[14] Hislop HJ and Montgomery J. *Daniels and Worthingham's Muscle testing: techniques of manual examination*. 7th Edition, Singapore: W.B. Saunders, 2002.

[15] Sawner K. La Vigne J. B*runnstrom's Movement Therapy in Hemiplegia – A Neurophysiological Approach*. 2nd Edition, JB Lippincott: Philadelphia, 1992.

[16] Vernon HT, Aker P, Aramenko M, Battershill D, Alepin A, Penner T. Evaluation of neck muscle strength with a modified sphygmomanometer dynamometer: reliability and validity (Abstract). *Manipulative Physiol Ther* 1992 Jul-Aug;15(6):343-9. Accessed from http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1431617&dopt=Citation on May 25, 2007.

[17] Kaegi C, Thibault MC, Giroux F, Bourbonnais D. The interrater reliabilty of force measurements using a modified sphygmomanometer in elderly subjects (Abstract). *Phys Ther* Oct 1998;78(10):1095-1103. Accessed from http://www.ptjournal.org/cgi/content/abstract/78/10/1095 on May 25, 2007.

[18] Umphred DA. "Differential diagnosis phase 2: examination and evaluation of disabilities and impairments" in *Neurological Rehabilitation*. 4th Edition, Mosby: St. Louis, 2001, 46.

[19] Turner PA, Harby-Owren H, Shackleford F, et al. Audits of physiotherapy practice. *Physiotherapy Theory and Practice* 1999;15:261-274.

[20] Schumacher K, Brodnik M, Sachs L, Schiller MR. Therapists' anxiety and attitudes toward computerized documentation in the clinical setting. *J Allied Health*. 1997;26(4):151-158.